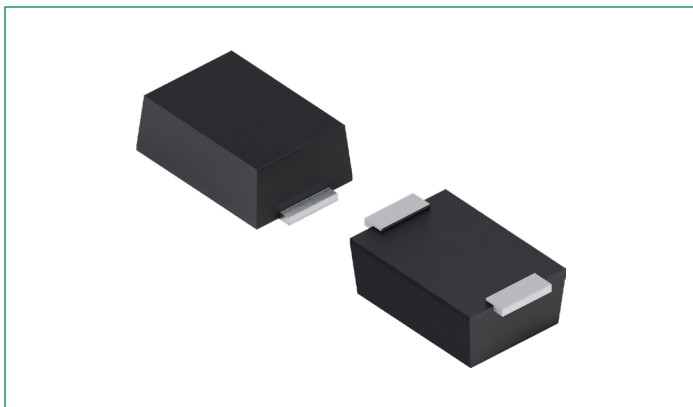


DS0402S4ARP

2 A Silicon Schottky Barrier Diode

RoHS

AUTOMOTIVE GRADE



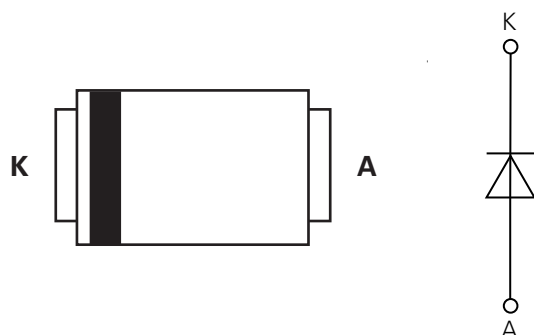
Description

These silicon Schottky Barrier Diodes with the principle of a metal-to-silicon in power rectifier, resulting in a very low forward voltage drop and stable electrical performance. The devices are assembled in a compact SOD-123FL package, which is well suited for automated assembly processes. All devices are PPAP Level 3 compliant.

Features

- Reverse leakage current $I_{RRM} \leq 0.5 \text{ mA @ } 25^\circ\text{C}$
- Forward voltage $V_F \leq 0.51 \text{ V @ } 2 \text{ A}$
- AEC-Q101 qualified
- Compact design in a SOD-123FL package
- Maximum virtual junction temperature of 150°C
- PPAP capable

Pinout Diagram (SOD-123FL)



A: Anode; **K:** Cathode

Benefits

- Reduces the PCB area and ideal for automated assembly
- Higher current in the same package
- High efficiency
- Low stand-by losses
- Ensures compliance with automotive industry standards

Applications

- Switch Mode Power Supplies (SMPS)
- Freewheeling diodes
- Reverse battery polarity protection
- DC-DC converter

Product Summary

Characteristic	Value	Unit
V_{RRM}	40	V
$I_{F(AV)}$	2	A

Maximum Ratings

Symbol	Characteristics	Conditions	Value	Units
V_{RRM}	Repetitive Peak Reverse Voltage	$T_{vj} = 25\text{ }^{\circ}\text{C}$	40	V
$I_{F(AV)}$	Average Forward Current	$T_L = 125\text{ }^{\circ}\text{C}$	2	A
I_{FSM}	Non-repetitive Surge Forward Current	Single half cycle; $f = 50\text{ Hz}$; $T_{vj}(\text{initial}) = 25\text{ }^{\circ}\text{C}$	80	A
		Single half cycle; $f = 60\text{ Hz}$; $T_{vj}(\text{initial}) = 25\text{ }^{\circ}\text{C}$	88	
T_{vj}	Virtual Junction Temperature Range	–	–65 to +150	$^{\circ}\text{C}$
T_{stg}	Storage Temperature Range	–	–65 to +150	$^{\circ}\text{C}$
I^2t	I^2t Value	$t_p = 8.3\text{ ms}$, $T_{vj} = 25\text{ }^{\circ}\text{C}$	32	A^2S

Static Characteristics

Symbol	Characteristics	Conditions	Value			Units
			Min.	Typ.	Max.	
V_F	Forward Voltage	$I_F = 2\text{ A}$, $T_{vj} = 25\text{ }^{\circ}\text{C}$	–	–	0.51	V
I_R	Reverse Current	$V_R = V_{RRM}$	$T_{vj} = 25\text{ }^{\circ}\text{C}$		0.5	mA
			$T_{vj} = 125\text{ }^{\circ}\text{C}$		10	
$V_{(TO)}$	Threshold Voltage	$T_{vj} = 150\text{ }^{\circ}\text{C}$	–	–	0.32	V
r_T	Slope Resistance	$T_{vj} = 150\text{ }^{\circ}\text{C}$	–	–	49	$\text{m}\Omega$

Thermal Specifications

Symbol	Characteristics	Value	Unit
$R_{th(j-l)}$	Thermal Resistance, Junction to Lead	26	K/W
$R_{th(j-a)}$	Thermal Resistance, Junction to Ambient	90	K/W

Note: Mounted on a 1S1P 1" square FR-4 board, top layer pad size 2.0 mm * 2.0 mm & 2 oz 1" square copper plane

Characteristic Curves

Fig. 1. Typical forward characteristics

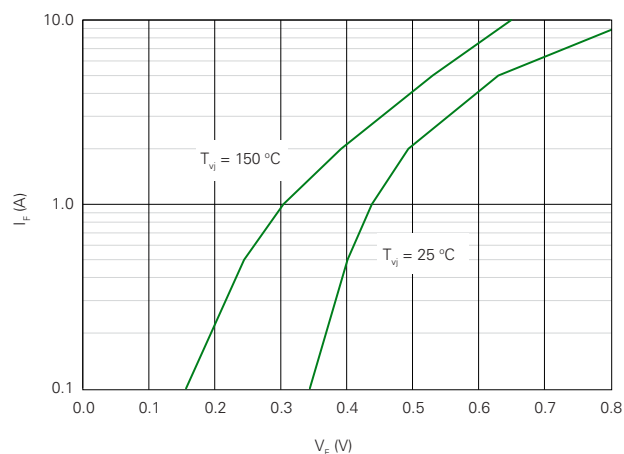


Fig. 2. Power Dissipation vs. Average Forward On-State Current (Typical)

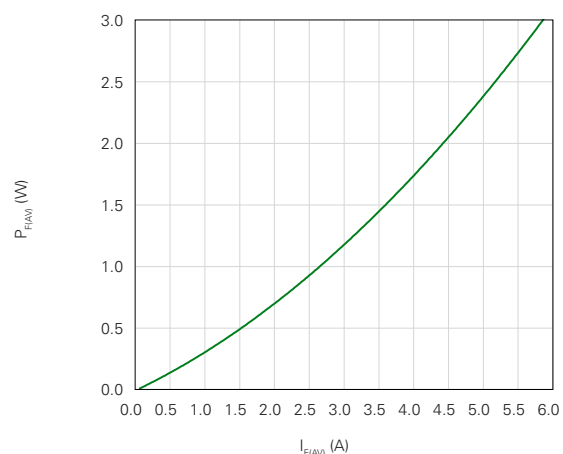


Fig. 3. Maximum Allowable Lead Temperature vs. Average On-State Current

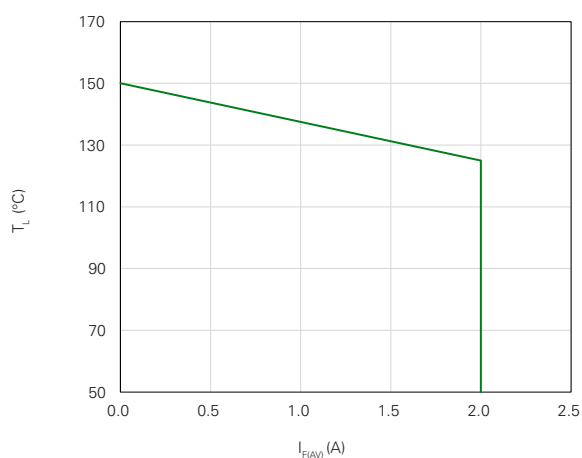


Fig. 4. Junction Capacitance vs. Reverse Voltage

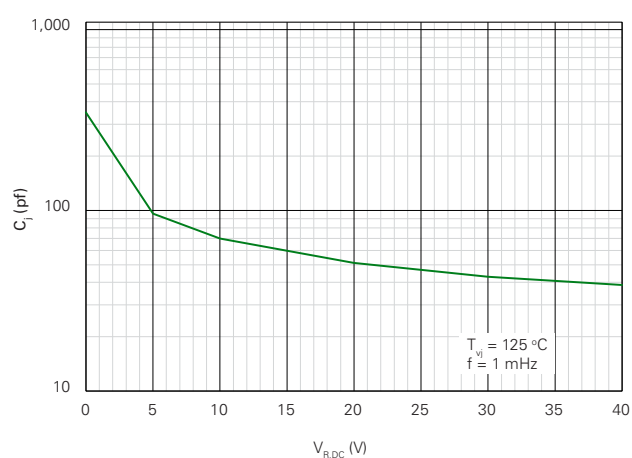
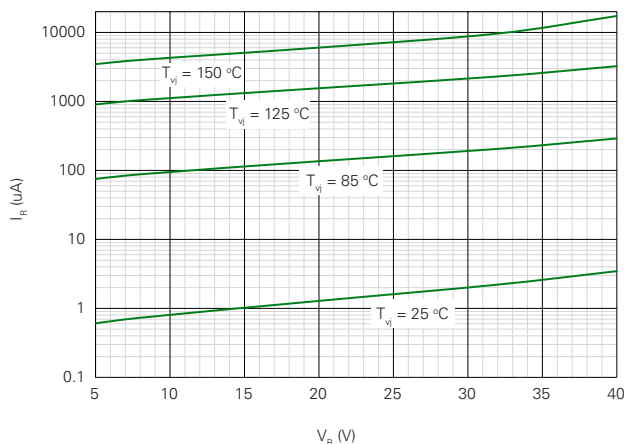
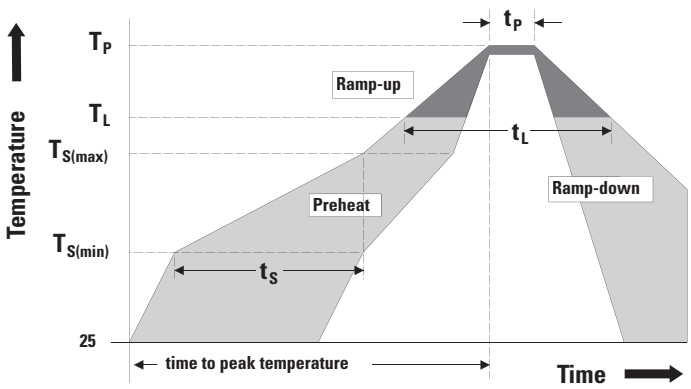


Fig. 5. Typical Reverse Characteristics



Soldering Parameters

Characteristic		Value
Reflow Condition		Lead-free assembly
Pre-heat	Temperature Min ($T_{s(min)}$)	150 °C
	Temperature Max ($T_{s(max)}$)	200 °C
	Time (min to max) (t_s)	60 – 120 secs
Average ramp up rate (Liquidus Temp) (T_L) to peak		3 K/s max.
$T_{s(max)}$ to T_L - Ramp-up Rate		3 K/s max.
Reflow	Temperature (T_L) (Liquidus)	217 °C
	Time (t_L)	60 – 150 seconds
Peak Temperature (T_P)		260 ^{+0/-5} °C
Time within 5 °C of actual peak Temperature (t_p)		30 seconds
Ramp-down Rate		6 K/s max.
Time 25 °C to peak Temperature (T_P)		8 minutes max.
Do Not Exceed		260 °C



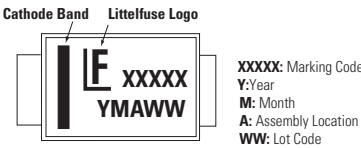
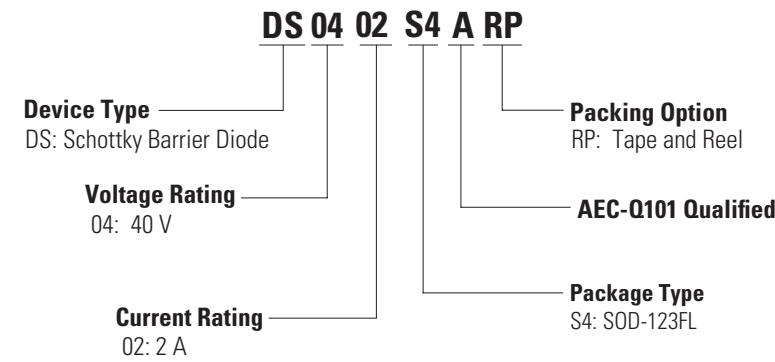
Physical Specifications

Characteristic	Value
Terminal Finish	100% Matte Tin-plated
Body Material	UL recognized compound meeting flammability rating V-0
Terminal Material	Copper Alloy

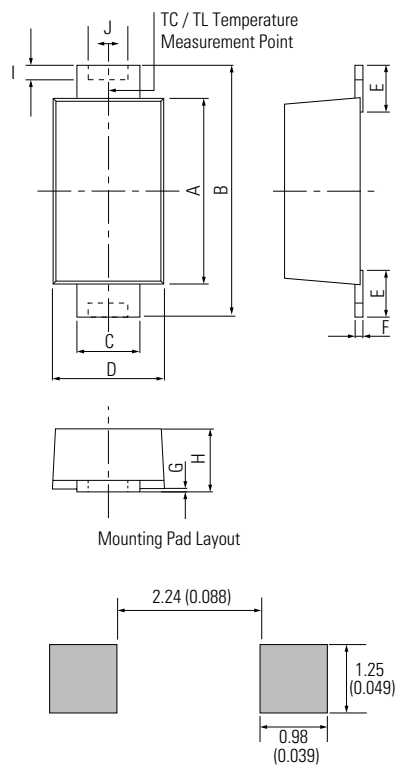
Packing Options

Part Number	Marking	Package	Packing Mode	Base Quantity
DS0402S4ARP	S402A	SOD-123FL	Tape & Reel – 8 mm tape/7" reel	3000

Part Numbering and Marking

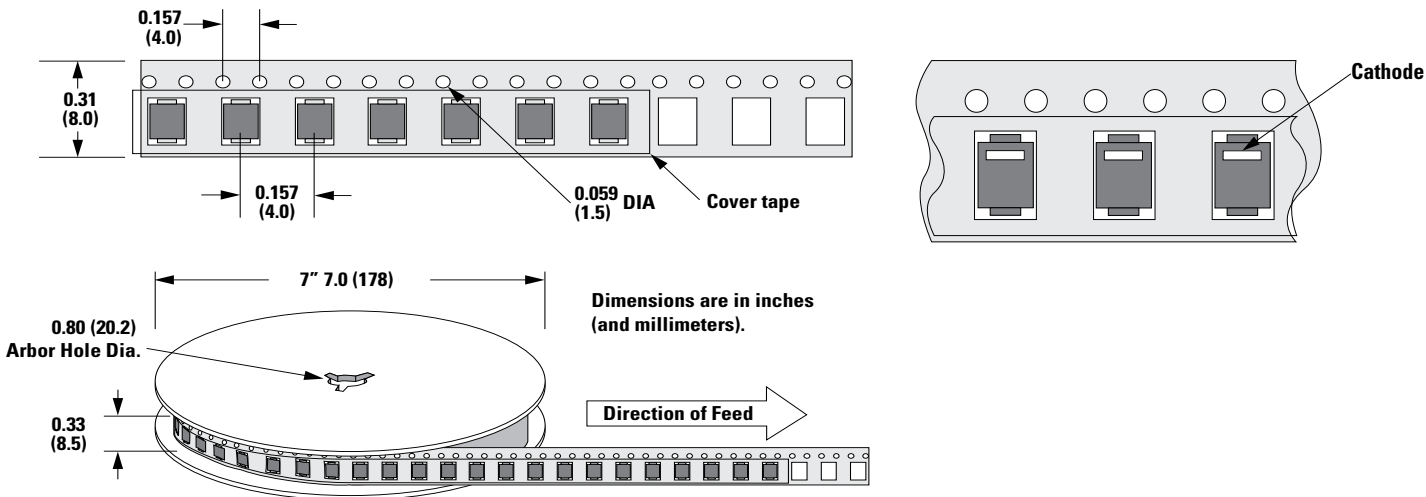


Package Dimensions SOD-123FL



Symbol	Millimeters		Inches	
	Min.	Max.	Min.	Max
A	2.50	3.10	0.0984	0.1220
B	3.40	3.90	0.1339	0.1535
C	0.70	1.20	0.0275	0.0472
D	1.50	2.00	0.0591	0.0787
E	0.35	0.90	0.0138	0.0354
F	0.05	0.26	0.0020	0.0102
G	0.00	0.10	0.000	0.0039
H	0.90	1.10	0.0354	0.0433
I	0.00	0.20	0.000	0.008
J	0.40	0.60	0.016	0.024

Tape and Reel Specification



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